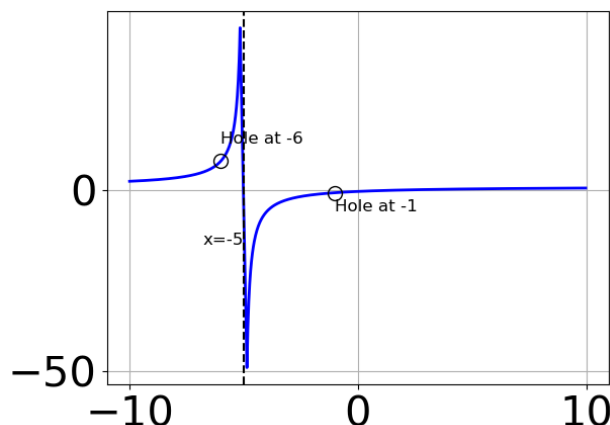


1. Which of the following functions *could* be the graph below?



A. $f(x) = \frac{x^3 + 7.0x^2 + 14.0x + 8.0}{x^3 - 12.0x^2 + 41.0x - 30.0}$

B. $f(x) = \frac{x^3 - 9.0x^2 + 20.0x - 12.0}{x^3 + 12.0x^2 + 41.0x + 30.0}$

C. $f(x) = \frac{x^3 + 5.0x^2 - 8.0x - 12.0}{x^3 + 12.0x^2 + 41.0x + 30.0}$

D. $f(x) = \frac{x^3 - 5.0x^2 - 8.0x + 12.0}{x^3 - 12.0x^2 + 41.0x - 30.0}$

E. None of the above are possible equations for the graph.

2. Determine the horizontal and/or oblique asymptotes in the rational function below.

$$f(x) = \frac{9x^3 - 39x^2 + 52x - 20}{3x^2 - 14x + 15}$$

A. Horizontal Asymptote of $y = 3.0$ and Oblique Asymptote of $y = 3x + 1$

B. Horizontal Asymptote of $y = 3.0$

C. Horizontal Asymptote of $y = 3.0$ and Oblique Asymptote of $y = 3x + 1$

D. Horizontal Asymptote at $y = 3.0$

E. Oblique Asymptote of $y = 3x + 1$.

3. Determine the vertical asymptotes and holes in the rational function below.

$$f(x) = \frac{12x^3 - 7x^2 - 72x - 45}{6x^2 - 5x - 25}$$

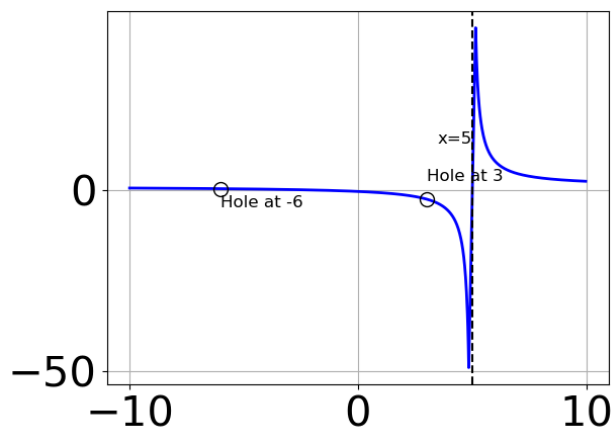
- A. Vertical Asymptotes of $x = 2.5$ and $x = -0.75$ with a hole at $x = -1.667$
- B. Vertical Asymptotes of $x = 2.5$ and $x = -1.667$ with no holes.
- C. Vertical Asymptote of $x = 2.0$ and hole at $x = -1.667$
- D. Holes at $x = 2.5$ and $x = -1.667$ with no vertical asymptotes.
- E. Vertical Asymptote of $x = 2.5$ and hole at $x = -1.667$

4. Determine the horizontal and/or oblique asymptotes in the rational function below.

$$f(x) = \frac{3x^2 + 11x - 20}{9x^3 - 63x^2 + 128x - 80}$$

- A. Oblique Asymptote of $y = 3x - 32$.
- B. Horizontal Asymptote at $y = -5.000$
- C. Horizontal Asymptote of $y = 0.333$
- D. Horizontal Asymptote of $y = 0.333$ and Oblique Asymptote of $y = 3x - 32$
- E. Horizontal Asymptote of $y = 0$

5. Which of the following functions *could* be the graph below?



- A. $f(x) = \frac{x^3 + 5.0x^2 - 12.0x - 36.0}{x^3 - 2.0x^2 - 33.0x + 90.0}$
- B. $f(x) = \frac{x^3 - 4.0x^2 - 4.0x + 16.0}{x^3 + 2.0x^2 - 33.0x - 90.0}$
- C. $f(x) = \frac{x^3 + 6.0x^2 + 3.0x - 10.0}{x^3 - 2.0x^2 - 33.0x + 90.0}$
- D. $f(x) = \frac{x^3 - 5.0x^2 - 12.0x + 36.0}{x^3 + 2.0x^2 - 33.0x - 90.0}$
- E. None of the above are possible equations for the graph.

6. Determine the horizontal and/or oblique asymptotes in the rational function below.

$$f(x) = \frac{4x^2 + 17x - 15}{20x^3 + 49x^2 - 112x + 48}$$

- A. Horizontal Asymptote at $y = -5.000$
- B. Horizontal Asymptote of $y = 0$
- C. Oblique Asymptote of $y = 5x - 9$.
- D. Horizontal Asymptote of $y = 0.200$ and Oblique Asymptote of $y = 5x - 9$
- E. Horizontal Asymptote of $y = 0.200$

7. Determine the vertical asymptotes and holes in the rational function below.

$$f(x) = \frac{12x^3 - 19x^2 - 45x - 18}{12x^2 + 25x + 12}$$

- A. Vertical Asymptotes of $x = -1.333$ and $x = -0.667$ with a hole at $x = -0.75$
 - B. Vertical Asymptotes of $x = -1.333$ and $x = -0.75$ with no holes.
 - C. Vertical Asymptote of $x = -1.333$ and hole at $x = -0.75$
 - D. Holes at $x = -1.333$ and $x = -0.75$ with no vertical asymptotes.
 - E. Vertical Asymptote of $x = 1.0$ and hole at $x = -0.75$
-

8. Determine the vertical asymptotes and holes in the rational function below.

$$f(x) = \frac{4x^3 - 12x^2 - 7x + 30}{6x^2 - 11x - 10}$$

- A. Vertical Asymptotes of $x = -0.667$ and $x = 2.5$ with no holes.
 - B. Vertical Asymptotes of $x = -0.667$ and $x = -1.5$ with a hole at $x = 2.5$
 - C. Vertical Asymptote of $x = -0.667$ and hole at $x = 2.5$
 - D. Vertical Asymptote of $x = 0.667$ and hole at $x = 2.5$
 - E. Holes at $x = -0.667$ and $x = 2.5$ with no vertical asymptotes.
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9. Determine the vertical asymptotes and holes in the rational function below.

$$f(x) = \frac{6x^3 + 23x^2 - 10x - 75}{4x^2 + 16x + 15}$$

- A. Vertical Asymptotes of $x = -1.5$ and $x = -2.5$ with no holes.
- B. Holes at $x = -1.5$ and $x = -2.5$ with no vertical asymptotes.
- C. Vertical Asymptotes of $x = -1.5$ and $x = 1.667$ with a hole at $x = -2.5$

- D. Vertical Asymptote of $x = 1.5$ and hole at $x = -2.5$
 - E. Vertical Asymptote of $x = -1.5$ and hole at $x = -2.5$
-

10. Determine the horizontal and/or oblique asymptotes in the rational function below.

$$f(x) = \frac{8x^3 + 26x^2 - 5x - 50}{4x^2 - 25x + 25}$$

- A. Horizontal Asymptote at $y = 5.0$
 - B. Horizontal Asymptote of $y = 2.0$
 - C. Horizontal Asymptote of $y = 2.0$ and Oblique Asymptote of $y = 2x + 19$
 - D. Horizontal Asymptote of $y = 5.0$ and Oblique Asymptote of $y = 2x + 19$
 - E. Oblique Asymptote of $y = 2x + 19$.
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